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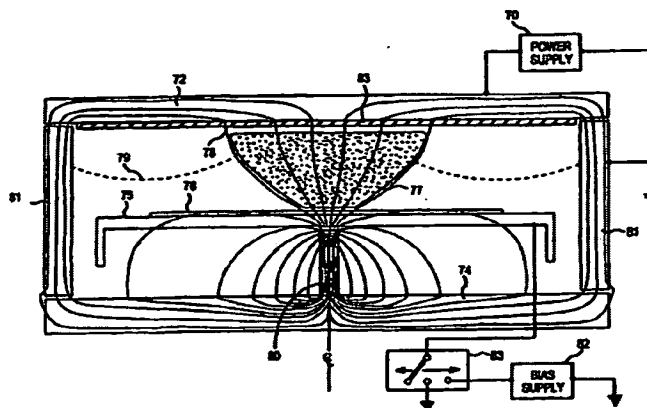
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(54) Title: **MAGNETIC MIRROR PLASMA SOURCE AND METHOD USING SAME**



(57) **Abstract:** A magnetic mirror plasma (77) source comprises two surfaces separated by a gap wherein one of the surfaces is a wafer (76) and the other surface is a cathode. The apparatus comprises a cover (72), target (83), shunt (74, 81), non-magnetic stage (75), magnet array (80), bias supply (82), and power supply (70). A mirror magnetic field (12) extends between the surfaces through the gap, wherein the magnetic field (78) lines at the substrate surface are at least two times as strong as those field lines entering the cathode. An anode is disposed such that a closed loop electron Hall current containment region is formed within the magnetic field, where with sufficient gas pressure and voltage between the cathode and anode, plasma is formed in the containment region. The result is a novel plasma source that has unique and important advantages enabling advancements in PECVD, etching, sputtering and plasma treatment processes.

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